What Is Claimed Is:

1. A catalyst component which consists of the orthorhombic phase of a mixed metal oxide of the formula

$$A_aV_bN_cX_dO_e$$

wherein A is at least one element selected from the group consisting of Mo and W, N is at least one element selected from the group consisting of Te and Se, and X is at least one element selected from the group consisting of Nb, Ta, Ti, Al, Zr, Cr, Mn, Fe, Ru, Co, Rh, Ni, Pt, Bi, B, In, Ce As, Ge, Sn, Li, Na, K, Rb, Cs, Fr, Be, Mg, Ca, Sr, Ba, Ra, Hf, Pb, P, Pm, Eu, Gd, Dy, Ho, Er, Tm, Yb, Lu, Au, Ag, Re, Pr, Zn, Ga, Pd, Ir, Nd, Y, Sm, Tb, Br, Cu, Sc, Cl, F and I,

wherein, when a = 1, b = 0.01 to 1, c = 0.01 to 1, d = 0.01 to 1 and e is dependent on the oxidation state of the other elements.

2. A process for preparing an orthorhombic phase mixed metal oxide catalyst, said process comprising:

(a) admixing compounds of elements A, V, N and X and at least one solvent to form a solution,

wherein A is at least one element selected from the group consisting of Mo and W, N is at least one element selected from the group consisting of Te, Se and Sb, and X is at least one element selected from the group consisting of Nb, Ta, Ti, Al, Zr, Cr, Mn, Fe, Ru, Co, Rh, Ni, Pt, Bi, B, In, Ce, As, Ge, Sn, Li, Na, K, Rb, Cs, Fr, Be, Mg, Ca, Sr, Ba, Ra, Hf, Pb, P, Pm, Eu, Gd, Dy, Ho, Er, Tm, Yb, Lu, Au, Ag, Re, Pr, Zn, Ga, Pd, Ir, Nd, Y, Sm, Tb, Br, Cu, Sc, Cl, F and I,

wherein A, V, N and X are present in such amounts that the atomic ratio of A : V : N : X is a : b : c : d, and

wherein, when a = 1, b = 0.01 to 1, c = 0.01 to 1 and d = 0.01 to 1;

(b) admixing a seeding effective amount of an orthorhombic phase mixed metal oxide seed, substantially free of hexagonal phase mixed metal oxide, with said solution to form a seeded solution,

(c) removing said at least one solvent from said seeded solution to form a catalyst precursor; and

(d) calcining said catalyst precursor to obtain said orthorhombic phase mixed metal oxide catalyst.

3. The process for preparing an orthorhombic phase mixed metal oxide catalyst according to claim 2, wherein N is at least one element selected from the group consisting of Te and Se.

4. The process for preparing an orthorhombic phase mixed metal oxide catalyst according to claim 2, wherein said orthorhombic phase mixed metal oxide seed, substantially free of hexagonal phase mixed metal oxide, is prepared by the process comprising:

(i) providing a mixed metal oxide having the empirical formula

$$A_aV_bN_cX_dO_e$$

wherein A is at least one element selected from the group consisting of Mo and W, N is at least one element selected from the group consisting of Te, Se and Sb, and X is at least one element selected from the group consisting of Nb, Ta, Ti, Al, Zr, Cr, Mn, Fe, Ru, Co, Rh, Ni, Pt, Bi, B, In, Ce, As, Ge, Sn, Li, Na, K, Rb, Cs, Fr, Be, Mg, Ca, Sr, Ba, Ra, Hf, Pb, P, Pm, Eu, Gd, Dy, Ho, Er, Tm, Yb, Lu, Au, Ag, Re, Pr, Zn, Ga, Pd, Ir, Nd, Y, Sm, Tb, Br, Cu, Sc, Cl, F and I, and

wherein, when a = 1, b = 0.01 to 1, c = 0.01 to 1, d = 0.01 to 1 and e is dependent on the oxidation state of the other elements;

(ii) contacting said mixed metal oxide with a liquid contact member selected from the group consisting of organic acids, alcohols, inorganic acids and hydrogen peroxide to form a contact mixture;

and

(iii) recovering insoluble material from said contact mixture to obtain said orthorhombic phase mixed metal oxide seed substantially free of hexagonal phase mixed metal oxide.

5. The process for preparing an orthorhombic phase mixed metal oxide catalyst according to claim 4, wherein said liquid contact member is an aqueous solution of oxalic acid.

6. The process for preparing an orthorhombic phase mixed metal oxide catalyst according to claim 2, wherein said orthorhombic phase mixed metal oxide seed, substantially free of hexagonal phase mixed metal oxide, is prepared by the process comprising:

(a) admixing compounds of elements A, V, N and X and at least one solvent to form a first mixture,

wherein A is at least one element selected from the group consisting of Mo and W, N is at least one element selected from the group consisting of Te, Se and Sb, and X is at least one element selected from the group consisting of Nb, Ta, Ti, Al, Zr, Cr, Mn, Fe, Ru, Co, Rh, Ni, Pt, Bi, B, In, Ce, As, Ge, Sn, Li, Na, K, Rb, Cs, Fr, Be, Mg, Ca, Sr, Ba, Ra, Hf, Pb, P, Pm, Eu, Gd, Dy, Ho, Er, Tm, Yb, Lu, Au, Ag, Re, Pr, Zn, Ga, Pd, Ir, Nd, Y, Sm, Tb, Br, Cu, Sc, Cl, F and I,

wherein A, V, M and X are present in such amounts that the atomic ratio of A : V : M : X is a : b : c : d, and

wherein, when a = 1, b = 0.01 to 1, c = 0.01 to 1 and d = 0.01 to 1;

(b) removing said at least one solvent from said first mixture to form a first precursor;

(c) calcining said first precursor to form a first calcined precursor;

(d) contacting said first calcined precursor with a liquid contact member selected from the group consisting of organic acids, alcohols, inorganic acids and hydrogen peroxide to form a contact mixture; and

(e) recovering insoluble material from said contact mixture to obtain said orthorhombic phase mixed metal oxide seed, substantially free of hexagonal phase mixed metal oxide.

7. The process for preparing an orthorhombic phase mixed metal oxide catalyst according to claim 6, wherein said liquid contact member is an aqueous solution of oxalic acid.

8. A process for producing an unsaturated carboxylic acid which comprises subjecting an alkane, or a mixture of an alkane and an alkene, to a vapor phase catalytic oxidation reaction in the presence of an orthorhombic phase mixed metal oxide catalyst, produced by the process of claim 2.

9. A process for producing an unsaturated nitrile which comprises subjecting an alkane, or a mixture of an alkane and an alkene, and ammonia to a vapor phase catalytic oxidation reaction in the presence of an orthorhombic phase mixed metal oxide catalyst, produced by the process of claim 3.